

## REMARKS

In the Office Action the Examiner objected to the title, rejected claim 9 under 35 U.S.C. 112, second paragraph, for being indefinite, rejected claims 1-4, 6-18, and 42-45 under 35 U.S.C. 103 for being obvious, rejected claim 41 under 35 U.S.C. 102 for being anticipated, and objected to claim 5 for depending on a rejected base claim.

The rejection for indefiniteness of claim 9 was based on using the term "predetermined." Claim 9 has been amended to delete the use of this term.

The rejection for obviousness in all cases at least included combining two references, Duncombie and Osafune. The rejection of claims 7 and 9 further included Summerfelt and Hsieh, respectively. Duncombie discloses a variety of possible dielectrics for use in semiconductors that are characterized as perovskite type oxides (column 2, line 55). Listed are two that contain lanthanum, lead lanthanum zirconate titanate and lanthanum aluminate. The Examiner characterized Duncombie teaching a dielectric having oxygen, lanthanum, and aluminum. The Examiner in effect admitted that Duncombie does not teach that this dielectric contains nitrogen and thereby does not itself render the nitrogen-containing claims unpatentable. Only originally filed claim 41 did not include nitrogen. The Examiner then used Osafune as teaching "a dielectric layer as a oxynitride glass comprising lanthanum, aluminum, oxygen, and nitrogen ..." The Examiner then stated that it would have been obvious "to form a dielectric layer comprising lanthanum, aluminum, oxygen, and nitrogen, as taught by Osafune et al. in order to obtain the best resultant semiconductor device having the high-K dielectric constant as gate insulating."

Applicants respectfully disagree that this is a proper combination. Osafune discloses a material that is relevant "to composite products and to a fiber-reinforced plastic (FRP) product reinforced with said glass fiber." Applicants have not been able to find anywhere in Osafune any statement that this material would have any relevance to semiconductors or even that the material is a dielectric. Osafune discloses a process for making the material that is completely irrelevant to semiconductors. Osafune states at column 3, lines 4 - 7, "As mentioned above, the general process for manufacturing such a glass fiber comprises extruding a molten glass from a nozzle at a high speed and taking up the resulting tow of filament after solidification." On the other hand Duncombie states (column 1, lines 56 - 57) that "it would be beneficial if a new dielectric material was developed which could be directly deposited on silicon." The process of Osafune is not consistent with this objective of Duncombie.

Further, Duncombie states (column 1, lines 58 - 61), "This new dielectric material must exhibit low leakage as compared to dielectric materials presently employed in this field and must have a dielectric constant that is about 10 or above." Such considerations are not addressed by

Osafune. Accordingly, Applicants submit that Duncombie and Osafune are not a proper combination, that Osafune is not relevant art to Applicant's invention, and that these two references do not render Applicants' claims obvious. Thus, Applicants' view is that the independent claims, which now includes claim 42, are patentable and that the dependent claims add important limitations not properly addressed in view of the above comments concerning the references. Claim 43, for example states that the dielectric "consists of nitrided lanthanum aluminate."

~~Claim 41, rejected for anticipation, has been cancelled.~~

No amendment made was related to the statutory requirements of patentability unless expressly stated herein. No amendment made was for the purpose of narrowing the scope of any claim, unless Applicant has argued herein that such amendment was made to distinguish over a particular reference or combination of references.

Applicants believe the application is in condition for allowance which action is respectfully solicited. Please contact the below-signed if there are any issues regarding this communication or otherwise concerning the current application.

If Applicant has overlooked any additional fees, or if any overpayment has been made, the Commissioner is hereby authorized to credit or debit Deposit Account 502117.

Respectfully submitted,

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**TITLE - VERSION WITH MARKINGS TO SHOW CHANGES MADE**  
**HIGH K DIELECTRIC FILM [AND METHOD FOR MAKING]**

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# CLAIMS - VERSION WITH MARKINGS TO SHOW CHANGES MADE

9. (Amended) The semiconductor structure of claim 1 wherein at least one element of the dielectric layer is graded from zero to [a predetermined] an amount grater than zero.

42. (Amended) [The] A semiconductor structure [of claim 41, wherein the dielectric feature further comprises] comprising:

a semiconductor substrate;

a dielectric feature comprising titanium, aluminum, nitrogen, and oxygen over the semiconductor substrate.

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